



SEQUENCE LISTING

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Imai, Shin-ichiro
Armstrong, Christopher

<120> METHODS FOR IDENTIFYING AGENTS WHICH ALTER HISTINE
PROTEIN ACETYLATION, DECREASE AGING, INCREASE LIFESPAN

<130> 13407-016001

<140> 09/461,580

<141> 1999-12-15

<160> 37

<170> FastSEQ for Windows Version 4.0

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<211> 737

<212> PRT

<213> Mus musculus

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35 40 45
Glu Pro Ser Ala Ala Val Ala Pro Ala Ala Ala Gly Cys Glu Ala Ala
50 55 60
Ser Ala Ala Ala Pro Ala Ala Leu Trp Arg Glu Ala Ala Gly Ala Ala
65 70 75 80
Ala Ser Ala Glu Arg Glu Ala Pro Ala Thr Ala Val Ala Gly Asp Gly
85 90 95
Asp Asn Gly Ser Gly Leu Arg Arg Glu Pro Arg Ala Ala Asp Asp Phe
100 105 110
Asp Asp Asp Glu Gly Glu Glu Glu Asp Glu Ala Ala Ala Ala Ala Ala
115 120 125
Ala Ala Ala Ile Gly Tyr Arg Asp Asn Leu Leu Leu Thr Asp Gly Leu
130 135 140
Leu Thr Asn Gly Phe His Ser Cys Glu Ser Asp Asp Asp Asp Arg Thr
145 150 155 160
Ser His Ala Ser Ser Ser Asp Trp Thr Pro Arg Pro Arg Ile Gly Pro
165 170 175
Tyr Thr Phe Val Gln Gln His Leu Met Ile Gly Thr Asp Pro Arg Thr
180 185 190
Ile Leu Lys Asp Leu Leu Pro Glu Thr Ile Pro Pro Pro Glu Leu Asp
195 200 205
Asp Met Thr Leu Trp Gln Ile Val Ile Asn Ile Leu Ser Glu Pro Pro
210 215 220
Lys Arg Lys Lys Arg Lys Asp Ile Asn Thr Ile Glu Asp Ala Val Lys
225 230 235 240
Leu Leu Gln Glu Cys Lys Lys Ile Ile Val Leu Thr Gly Ala Gly Val
245 250 255

Ser Val Ser Cys Gly Ile Pro Asp Phe Arg Ser Arg Asp Gly Ile Tyr
 260 265 270
 Ala Arg Leu Ala Val Asp Phe Pro Asp Leu Pro Asp Pro Gln Ala Met
 275 280 285
 Phe Asp Ile Glu Tyr Phe Arg Lys Asp Pro Arg Pro Phe Phe Lys Phe
 290 295 300
 Ala Lys Glu Ile Tyr Pro Gly Gln Phe Gln Pro Ser Leu Cys His Lys
 305 310 315 320
 Phe Ile Ala Leu Ser Asp Lys Glu Gly Lys Leu Leu Arg Asn Tyr Thr
 325 330 335
 Gln Asn Ile Asp Thr Leu Glu Gln Val Ala Gly Ile Gln Arg Ile Leu
 340 345 350
 Gln Cys His Gly Ser Phe Ala Thr Ala Ser Cys Leu Ile Cys Lys Tyr
 355 360 365
 Lys Val Asp Cys Glu Ala Val Arg Gly Asp Ile Phe Asn Gln Val Val
 370 375 380
 Pro Arg Cys Pro Arg Cys Pro Ala Asp Glu Pro Leu Ala Ile Met Lys
 385 390 395 400
 Pro Glu Ile Val Phe Phe Gly Glu Asn Leu Pro Glu Gln Phe His Arg
 405 410 415
 Ala Met Lys Tyr Asp Lys Asp Glu Val Asp Leu Leu Ile Val Ile Gly
 420 425 430
 Ser Ser Leu Lys Val Arg Pro Val Ala Leu Ile Pro Ser Ser Ile Pro
 435 440 445
 His Glu Val Pro Gln Ile Leu Ile Asn Arg Glu Pro Leu Pro His Leu
 450 455 460
 His Phe Asp Val Glu Leu Leu Gly Asp Cys Asp Val Ile Ile Asn Glu
 465 470 475 480
 Leu Cys His Arg Leu Gly Gly Glu Tyr Ala Lys Leu Cys Cys Asn Pro
 485 490 495
 Val Lys Leu Ser Glu Ile Thr Glu Lys Pro Pro Arg Pro Gln Lys Glu
 500 505 510
 Leu Val His Leu Ser Glu Leu Pro Thr Pro Leu His Ile Ser Glu
 515 520 525
 Asp Ser Ser Ser Pro Glu Arg Thr Val Pro Gln Asp Ser Ser Val Ile
 530 535 540
 Ala Thr Leu Val Asp Gln Ala Thr Asn Asn Asn Val Asn Asp Leu Glu
 545 550 555 560
 Val Ser Glu Ser Ser Cys Val Glu Glu Lys Pro Gln Glu Val Gln Thr
 565 570 575
 Ser Arg Asn Val Glu Asn Ile Asn Val Glu Asn Pro Asp Phe Lys Ala
 580 585 590
 Val Gly Ser Ser Thr Ala Asp Lys Asn Glu Arg Thr Ser Val Ala Glu
 595 600 605
 Thr Val Arg Lys Cys Trp Pro Asn Arg Leu Ala Lys Glu Gln Ile Ser
 610 615 620
 Lys Arg Leu Glu Gly Asn Gln Tyr Leu Phe Val Pro Pro Asn Arg Tyr
 625 630 635 640
 Ile Phe His Gly Ala Glu Val Tyr Ser Asp Ser Glu Asp Asp Val Leu
 645 650 655
 Ser Ser Ser Ser Cys Gly Ser Asn Ser Asp Ser Gly Thr Cys Gln Ser
 660 665 670
 Pro Ser Leu Glu Glu Pro Leu Glu Asp Glu Ser Glu Ile Glu Glu Phe
 675 680 685
 Tyr Asn Gly Leu Glu Asp Asp Thr Glu Arg Pro Glu Cys Ala Gly Gly
 690 695 700
 Ser Gly Phe Gly Ala Asp Gly Gly Asp Gln Glu Val Val Asn Glu Ala

705 710 715 720
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<211> 272
<212> PRT
<213> Saccharomyces cerevisiae
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Ile	Asp	His	Phe	Ile	Gln	Lys	Leu	His	Thr	Ala	Arg	Lys	Ile	Leu	Val
			20					25					30		
Leu	Thr	Gly	Ala	Gly	Val	Ser	Thr	Ser	Leu	Gly	Ile	Pro	Asp	Phe	Arg
			35				40					45			
Ser	Ser	Glu	Gly	Phe	Tyr	Ser	Lys	Ile	Lys	His	Leu	Gly	Leu	Asp	Asp
	50					55					60				
Pro	Gln	Asp	Val	Phe	Asn	Tyr	Asn	Ile	Phe	Met	His	Asp	Pro	Ser	Val
65					70					75					80
Phe	Tyr	Asn	Ile	Ala	Asn	Met	Val	Leu	Pro	Pro	Glu	Lys	Ile	Tyr	Ser
				85					90					95	
Pro	Leu	His	Ser	Phe	Ile	Lys	Met	Leu	Gln	Met	Lys	Gly	Lys	Leu	Leu
			100					105					110		
Arg	Asn	Tyr	Thr	Gln	Asn	Ile	Asp	Asn	Leu	Glu	Ser	Tyr	Ala	Gly	Ile
			115				120					125			
Ser	Thr	Asp	Lys	Leu	Val	Gln	Cys	His	Gly	Ser	Phe	Ala	Thr	Ala	Thr
			130			135					140				
Cys	Val	Thr	Cys	His	Trp	Asn	Leu	Pro	Gly	Glu	Arg	Ile	Phe	Asn	Lys
145					150					155					160
Ile	Arg	Asn	Leu	Glu	Leu	Pro	Leu	Cys	Pro	Tyr	Cys	Tyr	Lys	Lys	Arg
				165					170					175	
Arg	Glu	Tyr	Phe	Pro	Glu	Gly	Tyr	Asn	Asn	Lys	Val	Gly	Val	Ala	Ala
			180					185					190		
Ser	Gln	Gly	Ser	Met	Ser	Glu	Arg	Pro	Pro	Tyr	Ile	Leu	Asn	Ser	Tyr
			195				200					205			
Gly	Val	Leu	Lys	Pro	Asp	Ile	Thr	Phe	Phe	Gly	Glu	Ala	Leu	Pro	Asn
	210					215					220				
Lys	Phe	His	Lys	Ser	Ile	Arg	Glu	Asp	Ile	Leu	Glu	Cys	Asp	Leu	Leu
225					230					235				240	
Ile	Cys	Ile	Gly	Thr	Ser	Leu	Lys	Val	Ala	Pro	Val	Ser	Glu	Ile	Val
				245					250					255	
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<210> 3
<211> 267
<212> PRT
<213> Saccharomyces cerevisiae
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<400> 3
Ile Asn Lys Val Leu Ser Thr Arg Leu Arg Leu Pro Asn Phe Asn Thr
1 5 10 15
Ile Asp His Phe Thr Ala Thr Leu Arg Asn Ala Lys Lys Ile Leu Val
20 25 30

Leu	Thr	Gly	Ala	Gly	Val	Ser	Thr	Ser	Leu	Gly	Ile	Pro	Asp	Phe	Arg
		35					40					45			
Ser	Ser	Glu	Gly	Phe	Tyr	Ser	Lys	Ile	Arg	His	Leu	Gly	Leu	Glu	Asp
	50					55				60					
Pro	Gln	Asp	Val	Phe	Asn	Leu	Asp	Ile	Phe	Leu	Gln	Asp	Pro	Ser	Val
65					70				75					80	
Phe	Tyr	Asn	Ile	Ala	His	Met	Val	Leu	Pro	Pro	Glu	Asn	Met	Tyr	Ser
				85				90						95	
Pro	Leu	His	Ser	Phe	Ile	Lys	Met	Leu	Gln	Asp	Lys	Gly	Lys	Leu	Leu
			100				105				110				
Arg	Asn	Tyr	Thr	Gln	Asn	Ile	Asp	Asn	Leu	Glu	Ser	Tyr	Ala	Gly	Ile
		115				120					125				
Asp	Pro	Asp	Lys	Leu	Val	Gln	Cys	His	Gly	Ser	Phe	Ala	Thr	Ala	Ser
	130					135					140				
Cys	Val	Thr	Cys	His	Trp	Gln	Ile	Pro	Gly	Glu	Lys	Ile	Phe	Glu	Asn
145					150					155				160	
Ile	Arg	Asn	Leu	Glu	Leu	Pro	Leu	Cys	Pro	Tyr	Cys	Tyr	Gln	Lys	Arg
				165					170					175	
Lys	Gln	Tyr	Phe	Pro	Met	Ser	Asn	Gly	Asn	Asn	Thr	Val	Gln	Thr	Asn
			180					185					190		
Ile	Asn	Phe	Asn	Ser	Pro	Ile	Leu	Lys	Ser	Tyr	Gly	Val	Leu	Lys	Pro
		195				200						205			
Asp	Met	Thr	Phe	Phe	Gly	Glu	Ala	Leu	Pro	Ser	Arg	Phe	His	Lys	Thr
	210					215					220				
Ile	Arg	Lys	Asp	Ile	Leu	Glu	Cys	Asp	Leu	Leu	Ile	Cys	Ile	Gly	Thr
225					230					235				240	
Ser	Leu	Lys	Val	Ala	Pro	Val	Ser	Glu	Ile	Val	Asn	Met	Val	Pro	Ser
				245					250					255	
His	Val	Pro	Gln	Ile	Leu	Ile	Asn	Arg	Asp	Met					
			260					265							

$\langle 210 \rangle$ 4

<211> 245

<212> PRT

<213> Mus musculus

<400> 4

Val 1	Ile	Asn	Ile	Leu 5	Ser	Glu	Pro	Pro	Lys 10	Arg	Lys	Lys	Arg	Lys 15	Asp
Ile	Asn	Thr	Ile	Glu	Asp	Ala	Val	Lys	Leu	Leu	Gln	Glu	Cys	Lys	Lys
			20					25					30		
Ile	Ile	Val	Leu	Thr	Gly	Ala	Gly	Val	Ser	Val	Ser	Cys	Gly	Ile	Pro
		35				40					45				
Asp	Phe	Arg	Ser	Arg	Asp	Gly	Ile	Tyr	Ala	Arg	Leu	Ala	Val	Asp	Phe
	50					55				60					
Pro	Asp	Leu	Pro	Asp	Pro	Gln	Ala	Met	Phe	Asp	Ile	Glu	Tyr	Phe	Arg
65				70					75					80	
Lys	Asp	Pro	Arg	Pro	Phe	Phe	Lys	Phe	Ala	Lys	Glu	Ile	Tyr	Pro	Gly
				85				90						95	
Gln	Phe	Gln	Pro	Ser	Leu	Cys	His	Lys	Phe	Ile	Ala	Leu	Ser	Asp	Lys
			100					105					110		
Glu	Gly	Lys	Leu	Leu	Arg	Asn	Tyr	Thr	Gln	Asn	Ile	Asp	Thr	Leu	Glu
		115				120					125				
Gln	Val	Ala	Gly	Ile	Gln	Arg	Ile	Leu	Gln	Cys	His	Gly	Ser	Phe	Ala
	130					135				140					
Thr	Ala	Ser	Cys	Leu	Ile	Cys	Lys	Tyr	Lys	Val	Asp	Cys	Glu	Ala	Val
145				150					155					160	

Arg Gly Asp Ile Phe Asn Gln Val Val Pro Arg Cys Pro Arg Cys Pro
 165 170 175
 Ala Asp Glu Pro Leu Ala Ile Met Lys Pro Glu Ile Val Phe Phe Gly
 180 185 190
 Glu Asn Leu Pro Glu Gln Phe His Arg Ala Met Lys Tyr Asp Lys Asp
 195 200 205
 Glu Val Asp Leu Leu Ile Val Ile Gly Ser Ser Leu Lys Val Arg Pro
 210 215 220
 Val Ala Leu Ile Pro Ser Ser Ile Pro His Glu Val Pro Gln Ile Leu
 225 230 235 240
 Ile Asn Arg Glu Pro
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<210> 5

<211> 237

<212> PRT

<213> Salmonella typhimurium

<400> 5

Met Met Glu Asn Pro Arg Val Leu Val Leu Thr Gly Ala Gly Ile Ser
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 Ala Glu Ser Gly Ile Arg Thr Phe Arg Ala Ala Asp Gly Leu Trp Glu
 20 25 30
 Glu His Arg Val Glu Asp Val Ala Thr Pro Glu Gly Phe Ala Arg Asn
 35 40 45
 Pro Gly Leu Val Gln Thr Phe Tyr Asn Ala Arg Arg Gln Gln Leu Gln
 50 55 60
 Gln Pro Glu Ile Gln Pro Asn Ala Ala His Leu Ala Leu Ala Asn Leu
 65 70 75 80
 Lys Lys Arg Leu Ala Ile Ala Phe Leu Leu Val Thr Gln Asn Ile Asp
 85 90 95
 Asn Leu His Glu Arg Ala Gly Asn Arg Asn Ile Ile Gln Met His Gly
 100 105 110
 Glu Leu Leu Lys Val Arg Cys Ser Gln Ser Gly Gln Ile Leu Glu Trp
 115 120 125
 Asn Gly Asp Val Met Pro Glu Asp Lys Cys His Cys Cys Gln Phe Pro
 130 135 140
 Ala Pro Leu Arg Pro His Val Val Trp Phe Gly Glu Met Pro Leu Gly
 145 150 155 160
 Met Asp Glu Ile Tyr Met Ala Leu Ser Met Ala Asp Ile Phe Ile Ala
 165 170 175
 Ile Gly Thr Ser Gly His Val Tyr Pro Ala Ala Gly Phe Val His Glu
 180 185 190
 Ala Lys Leu His Gly Ala His Thr Val Glu Leu Asn Leu Glu Pro Ser
 195 200 205
 Gln Val Gly Asn Glu Phe Glu Glu Lys His Tyr Gly Pro Ala Ser Gln
 210 215 220
 Val Val Pro Glu Phe Val Asp Lys Phe Leu Lys Gly Leu
 225 230 235

<210> 6

<211> 21

<212> PRT

<213> Homo sapiens

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Ala Arg Thr Lys Gln Thr Ala Arg Lys Ser Thr Gly Gly Lys Ala Pro

1 5 10 15
 Arg Lys Gln Leu Cys
 20

<210> 7
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 <213> Homo sapiens

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 Ser Gly Arg Gly Lys Gly Gly Lys Gly Leu Gly Lys Gly Gly Ala Lys
 1 5 10 15
 Arg His Arg Cys
 20

<210> 8
 <211> 19
 <212> PRT
 <213> Homo sapiens

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 Ala Gly Gly Lys Gly Gly Lys Gly Met Gly Lys Val Gly Ala Lys Arg
 1 5 10 15
 His Ser Cys

<210> 9
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 <212> PRT
 <213> Mus musculus

<400> 9
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 Phe Arg Ser Arg Asp Gly Ile Tyr Ala Arg Leu Ala Val Asp Phe Pro
 20 25 30
 Asp Leu Pro Asp Pro Gln Ala Met Phe Asp Ile Glu Tyr Phe Arg Lys
 35 40 45
 Asp Pro Arg Pro Phe Phe Lys Phe Ala Lys Glu Ile Tyr Pro Gly Gln
 50 55 60
 Phe Gln Pro Ser Leu Cys His Lys Phe Ile Ala Leu Ser Asp Lys Glu
 65 70 75 80
 Gly Lys Leu Leu Arg Asn Tyr Thr Gln Asn Ile Asp Thr Leu Glu Gln
 85 90 95
 Val Ala Gly Ile Gln Arg Ile Leu Gln Cys His Gly Ser Phe Ala Thr
 100 105 110
 Ala Ser Cys Leu Ile Cys Lys Tyr Lys Val Asp Cys Glu Ala Val Arg
 115 120 125

<210> 10
 <211> 128
 <212> PRT
 <213> Saccharomyces cerevisiae

<400> 10
 Leu Val Leu Thr Gly Ala Gly Val Ser Thr Ser Leu Gly Ile Pro Asp
 1 5 10 15

Phe	Arg	Ser	Ser	Glu	Gly	Phe	Tyr	Ser	Lys	Ile	Lys	His	Leu	Gly	Leu
			20					25					30		
Asp	Asp	Pro	Gln	Asp	Val	Phe	Asn	Tyr	Asn	Ile	Phe	Met	His	Asp	Pro
		35					40					45			
Ser	Val	Phe	Tyr	Asn	Ile	Ala	Asn	Met	Val	Leu	Pro	Pro	Glu	Lys	Ile
	50					55					60				
Tyr	Ser	Pro	Leu	His	Ser	Phe	Ile	Lys	Met	Leu	Gln	Met	Lys	Gly	Lys
65					70					75					80
Leu	Leu	Arg	Asn	Tyr	Thr	Gln	Asn	Ile	Asp	Asn	Leu	Glu	Ser	Tyr	Ala
				85					90					95	
Gly	Ile	Ser	Thr	Asp	Lys	Leu	Val	Gln	Cys	His	Gly	Ser	Phe	Ala	Thr
			100					105					110		
Ala	Thr	Cys	Val	Thr	Cys	His	Trp	Asn	Leu	Pro	Gly	Glu	Arg	Ile	Phe
		115					120					125			

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<211> 336

<212> PRT

<213> *Saccharomyces cerevisiae*

<400> 11

Ala	Ile	Asn	Lys	Val	Leu	Cys	Thr	Arg	Leu	Arg	Leu	Ser	Asn	Phe	Phe
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Thr	Ile	Asp	His	Phe	Ile	Gln	Lys	Leu	His	Thr	Ala	Arg	Lys	Ile	Leu
			20					25					30		
Val	Leu	Thr	Gly	Ala	Gly	Val	Ser	Thr	Ser	Leu	Gly	Ile	Pro	Asp	Phe
		35					40					45			
Arg	Ser	Ser	Glu	Gly	Phe	Tyr	Ser	Lys	Ile	Lys	His	Leu	Gly	Leu	Asp
	50					55					60				
Asp	Pro	Gln	Asp	Val	Phe	Asn	Tyr	Asn	Ile	Phe	Met	His	Asp	Pro	Ser
65					70					75					80
Val	Phe	Tyr	Asn	Ile	Ala	Asn	Met	Val	Leu	Pro	Pro	Glu	Lys	Ile	Tyr
				85					90					95	
Ser	Pro	Leu	His	Ser	Phe	Ile	Lys	Met	Leu	Gln	Met	Lys	Gly	Lys	Leu
			100					105					110		
Leu	Arg	Asn	Tyr	Thr	Gln	Asn	Ile	Asp	Asn	Leu	Glu	Ser	Tyr	Ala	Gly
		115					120					125			
Ile	Ser	Thr	Asp	Lys	Leu	Val	Gln	Cys	His	Gly	Ser	Phe	Ala	Thr	Ala
		130				135					140				
Thr	Cys	Val	Thr	Cys	His	Trp	Asn	Leu	Pro	Gly	Glu	Arg	Ile	Phe	Asn
145					150					155					160
Lys	Ile	Arg	Asn	Leu	Glu	Leu	Pro	Leu	Cys	Pro	Tyr	Cys	Tyr	Lys	Lys
			165					170						175	
Arg	Arg	Glu	Tyr	Phe	Pro	Glu	Gly	Tyr	Asn	Asn	Lys	Val	Gly	Val	Ala
			180					185					190		
Ala	Ser	Gln	Gly	Ser	Met	Ser	Glu	Arg	Pro	Pro	Tyr	Ile	Leu	Asn	Ser
		195					200					205			
Tyr	Gly	Val	Leu	Lys	Pro	Asp	Ile	Thr	Phe	Phe	Gly	Glu	Ala	Leu	Pro
	210					215					220				
Asn	Lys	Phe	His	Lys	Ser	Ile	Arg	Glu	Asp	Ile	Leu	Glu	Cys	Asp	Leu
225					230					235					240
Leu	Ile	Cys	Ile	Gly	Thr	Ser	Leu	Lys	Val	Ala	Pro	Val	Ser	Glu	Ile
				245					250					255	
Val	Asn	Met	Val	Pro	Ser	His	Val	Pro	Gln	Val	Leu	Ile	Asn	Arg	Asp
			260					265					270		
Pro	Val	Lys	His	Ala	Glu	Phe	Asp	Leu	Ser	Leu	Leu	Gly	Tyr	Cys	Asp
		275					280					285			

Asp	Ile	Ala	Ala	Met	Val	Ala	Gln	Lys	Cys	Gly	Trp	Thr	Ile	Pro	His
290						295					300				
Lys	Lys	Trp	Asn	Asp	Leu	Lys	Asn	Lys	Asn	Phe	Lys	Cys	Gln	Glu	Lys
305					310					315					320
Asp	Lys	Gly	Val	Tyr	Val	Val	Thr	Ser	Asp	Glu	His	Pro	Lys	Thr	Leu
				325					330					335	

<210> 12
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 <212> PRT
 <213> Mus musculus

<400> 12															
Val	Ile	Asn	Ile	Leu	Ser	Glu	Pro	Pro	Lys	Arg	Lys	Lys	Arg	Lys	Asp
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Ile	Asn	Thr	Ile	Glu	Asp	Ala	Val	Lys	Leu	Leu	Gln	Glu	Cys	Lys	Lys
			20					25					30		
Ile	Ile	Val	Leu	Thr	Gly	Ala	Gly	Val	Ser	Val	Ser	Cys	Gly	Ile	Pro
		35					40					45			
Asp	Phe	Arg	Ser	Arg	Asp	Gly	Ile	Tyr	Ala	Arg	Leu	Ala	Val	Asp	Phe
50					55					60					
Pro	Asp	Leu	Pro	Asp	Pro	Gln	Ala	Met	Phe	Asp	Ile	Glu	Tyr	Phe	Arg
65				70					75					80	
Lys	Asp	Pro	Arg	Pro	Phe	Phe	Lys	Phe	Ala	Lys	Glu	Ile	Tyr	Pro	Gly
			85					90						95	
Gln	Phe	Gln	Pro	Ser	Leu	Cys	His	Lys	Phe	Ile	Ala	Leu	Ser	Asp	Lys
			100					105					110		
Glu	Gly	Lys	Leu	Leu	Arg	Asn	Tyr	Thr	Gln	Asn	Ile	Asp	Thr	Leu	Glu
	115						120					125			
Gln	Val	Ala	Gly	Ile	Gln	Arg	Ile	Leu	Gln	Cys	His	Gly	Ser	Phe	Ala
130					135					140					
Thr	Ala	Ser	Cys	Leu	Ile	Cys	Lys	Tyr	Lys	Val	Asp	Cys	Glu	Ala	Val
145				150					155					160	
Arg	Gly	Asp	Ile	Phe	Asn	Gln	Val	Val	Pro	Arg	Cys	Pro	Arg	Cys	Pro
			165					170						175	
Ala	Asp	Glu	Pro	Leu	Ala	Ile	Met	Lys	Pro	Glu	Ile	Val	Phe	Phe	Gly
		180					185					190			
Glu	Asn	Leu	Pro	Glu	Gln	Phe	His	Arg	Ala	Met	Lys	Tyr	Asp	Lys	Asp
	195						200					205			
Glu	Val	Asp	Leu	Leu	Ile	Val	Ile	Gly	Ser	Ser	Leu	Lys	Val	Arg	Pro
210					215						220				
Val	Ala	Leu	Ile	Pro	Ser	Ser	Ile	Pro	His	Glu	Val	Pro	Gln	Ile	Leu
225				230					235					240	
Ile	Asn	Arg	Glu	Pro	Leu	Pro	His	Leu	His	Phe	Asp	Val	Glu	Leu	Leu
			245					250						255	
Gly	Asp	Cys	Asp	Val	Ile	Ile	Asn	Glu	Leu	Cys	His	Arg	Leu	Gly	Gly
	260						265					270			
Glu	Tyr	Ala	Lys	Leu	Cys	Cys	Asn	Pro	Val	Lys	Leu	Ser	Glu	Ile	Thr
	275						280					285			
Glu	Lys	Pro	Pro	Arg	Pro	Gln	Lys	Glu	Leu	Val	His	Leu	Ser	Glu	Leu
290					295						300				
Pro	Pro	Thr	Pro	Leu	His	Ile	Ser	Glu	Asp	Ser	Ser	Ser	Pro	Glu	Arg
305				310					315						320
Thr	Val	Pro	Gln	Asp	Ser	Ser									
				325											

<210> 13

<211> 237
 <212> PRT
 <213> *Salmonella typhimurium*

<400> 13

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Met Met Glu Asn Pro Arg Val Leu Val Leu Thr Gly Ala Gly Ile Ser
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Ala Glu Ser Gly Ile Arg Thr Phe Arg Ala Ala Asp Gly Leu Trp Glu
          20           25           30
Glu His Arg Val Glu Asp Val Ala Thr Pro Glu Gly Pro Ala Arg Asn
          35           40           45
Pro Gly Leu Val Gln Thr Phe Tyr Asn Ala Arg Arg Gln Gln Leu Gln
          50           55           60
Gln Pro Glu Ile Gln Pro Asn Ala Ala His Leu Ala Leu Ala Asn Leu
65           70           75           80
Lys Lys Arg Leu Ala Ile Ala Phe Leu Leu Val Thr Gln Asn Ile Asp
          85           90           95
Asn Leu His Glu Arg Ala Gly Asn Arg Asn Ile Ile Gln Met His Gly
          100          105          110
Glu Leu Leu Lys Val Arg Cys Ser Gln Ser Gly Gln Ile Leu Glu Trp
          115          120          125
Asn Gly Asp Val Met Pro Glu Asp Lys Cys His Cys Cys Gln Phe Pro
          130          135          140
Ala Pro Leu Arg Pro His Val Val Trp Phe Gly Glu Met Pro Leu Gly
          145          150          155          160
Met Asp Glu Ile Tyr Met Ala Leu Ser Met Ala Asp Ile Phe Ile Ala
          165          170          175
Ile Gly Thr Ser Gly His Val Tyr Pro Ala Ala Gly Phe Val His Glu
          180          185          190
Ala Lys Leu His Gly Ala His Thr Val Glu Leu Asn Leu Glu Pro Ser
          195          200          205
Gln Val Gly Asn Glu Phe Glu Glu Lys His Tyr Gly Pro Ala Ser Gln
          210          215          220
Val Val Pro Glu Phe Val Asp Lys Phe Leu Lys Gly Leu
          225          230          235

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<210> 14
 <211> 106
 <212> PRT
 <213> *Saccharomyces cerevisiae*

<400> 14

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Ile Leu Val Leu Thr Gly Ala Gly Val Ser Thr Ser Leu Gly Ile Pro
 1           5           10           15
Asp Phe Arg Ser Ser Glu Gly Phe Tyr Ser Lys Ile Lys His Leu Gly
          20           25           30
Leu Asp Asp Pro Gln Asp Val Phe Asn Tyr Asn Ile Phe Met His Asp
          35           40           45
Pro Ser Val Phe Tyr Asn Ile Ala Asn Met Val Leu Pro Pro Glu Lys
          50           55           60
Ile Tyr Ser Pro Leu His Ser Phe Ile Lys Met Leu Gln Met Lys Gly
65           70           75           80
Lys Leu Leu Arg Asn Tyr Thr Gln Asn Ile Asp Asn Leu Glu Ser Tyr
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Ala Gly Ile Ser Thr Asp Lys Leu Val Gln
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 <212> PRT
 <213> *Saccharomyces cerevisiae*

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 20 25 30
 Leu Glu Asp Pro Gln Asp Val Phe Asn Leu Asp Ile Phe Leu Gln Asp
 35 40 45
 Pro Ser Val Phe Tyr Asn Ile Ala His Met Val Leu Pro Pro Glu Asn
 50 55 60
 Met Tyr Ser Pro Leu His Ser Phe Ile Lys Met Leu Gln Asp Lys Gly
 65 70 75 80
 Lys Leu Leu Arg Asn Tyr Thr Gln Asn Ile Asp Asn Leu Glu Ser Tyr
 85 90 95
 Ala Gly Ile Asp Pro Asp Lys Leu Val Gln
 100 105

<210> 16
 <211> 107
 <212> PRT
 <213> *Saccharomyces cerevisiae*

<400> 16
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 1 5 10 15
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 20 25 30
 Lys Leu Pro Tyr Pro Glu Ala Val Phe Asp Val Asp Phe Phe Gln Ser
 35 40 45
 Asp Pro Leu Pro Phe Tyr Thr Leu Ala Lys Glu Leu Tyr Pro Gly Asn
 50 55 60
 Phe Arg Pro Ser Lys Phe His Tyr Leu Leu Lys Leu Phe Gln Asp Lys
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 85 90 95
 Gln Ala Gly Val Lys Asp Asp Leu Ile Ile Glu
 100 105

<210> 17
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 <213> *Saccharomyces cerevisiae*

<400> 17
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 20 25 30
 Ser Gln Tyr Trp Ser Ile Lys Ser Gly Arg Glu Met Phe Asp Ile Ser
 35 40 45
 Leu Phe Arg Asp Asp Phe Lys Ile Ser Ile Phe Ala Lys Phe Met Glu
 50 55 60
 Arg Leu Tyr Ser Asn Val Gln Leu Ala Lys Pro Thr Lys Thr His Lys

[illegible]

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<213> Saccharomyces cerevisiae
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[illegible]

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<211> 106
<212> PRT
<213> Mus musculus
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			20					25					30		
Pro	Asp	Leu	Pro	Asp	Pro	Gln	Ala	Met	Phe	Asp	Ile	Glu	Tyr	Phe	Arg
		35					40					45			
Lys	Asp	Pro	Arg	Pro	Phe	Phe	Lys	Phe	Ala	Lys	Glu	Ile	Tyr	Pro	Gly
	50					55					60				
Gln	Phe	Gln	Pro	Ser	Leu	Cys	His	Lys	Phe	Ile	Ala	Leu	Ser	Asp	Lys
65					70					75				80	
Glu	Gly	Lys	Leu	Leu	Arg	Asn	Tyr	Thr	Gln	Asn	Ile	Asp	Thr	Leu	Glu
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Gln	Val	Ala	Gly	Ile	Gln	Arg	Ile	Leu	Gln						
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<210> 20
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<212> PRT
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<213> Mus musculus

<400> 20

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 1           5           10           15
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His Leu Pro Tyr Pro Glu Ala Ile Phe Glu Ile Ser Tyr Phe Lys Lys
           35           40           45
His Pro Glu Pro Phe Phe Ala Leu Ala Lys Glu Leu Tyr Pro Gly Gln
 50           55           60
Phe Lys Pro Thr Ile Cys His Tyr Phe Ile Arg Leu Leu Lys Glu Lys
65           70           75           80
Gly Leu Leu Leu Arg Cys Tyr Thr Gln Asn Ile Asp Thr Leu Glu Arg
           85           90           95
Val Ala Gly Leu Glu Pro Gln Asp Leu Val Glu
           100           105

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<210> 21

<211> 86

<212> PRT

<213> Mus musculus

<400> 21

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Gly Thr Arg Leu Tyr Ser Asn Leu Gln Gln Tyr Asp Ile Pro Tyr Pro
 1           5           10           15
Glu Ala Ile Phe Glu Leu Gly Phe Phe Phe His Asn Pro Lys Pro Phe
           20           25           30
Phe Met Leu Ala Lys Glu Leu Tyr Pro Gly His Tyr Arg Pro Asn Val
           35           40           45
Thr His Tyr Phe Leu Arg Leu Leu His Asp Lys Glu Leu Leu Leu Arg
 50           55           60
Leu Tyr Thr Gln Asn Ile Asp Gly Leu Glu Arg Ala Ser Gly Ile Pro
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Ala Ser Lys Leu Val Glu
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<210> 22

<211> 85

<212> PRT

<213> Unknown

<220>

<223> Unknown Protein

<400> 22

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           20           25           30
Ala Pro Lys Phe Asp Thr Thr Phe Glu Asn Ala Arg Pro Ser Lys Thr
           35           40           45
His Met Ala Leu Val Gln Leu Glu Arg Met Gly Phe Leu Ser Phe Leu
 50           55           60
Val Ser Gln Asn Val Asp Gly Leu Asp Val Arg Ser Gly Phe Pro Arg
65           70           75           80
Asp Lys Leu Ala Glu

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85

<210> 23
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 <213> Unknown

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<400> 23
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 20 25 30
 Pro Ile Gln His Ile Asp Phe Val Pro Val Leu Arg Ser Ala Ser Gly
 35 40 45
 Thr Trp Pro Glu Asn Leu Trp Ala Gly Leu Asn Ser Pro Leu Thr Asn
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 Pro Thr Gln His Thr Trp Leu
 65 70

<210> 24
 <211> 75
 <212> PRT
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<220>
 <223> Unknown Protein

<400> 24
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 20 25 30
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 35 40 45
 Phe Tyr His Tyr Arg Arg Glu Val Met Arg Ser Lys Glu Pro Asn Pro
 50 55 60
 Gly His Leu Ala Ile Ala Gln Cys Glu Ala Arg
 65 70 75

<210> 25
 <211> 3869
 <212> DNA
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<220>
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Glu	Val	Ala	Leu	Ala	Leu	Gln	Ala	Ala	Gly	Ser	Pro	Ser	Ala	Ala	Ala		
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gcc	atg	gag	gcc	gcg	tcg	cag	ccg	gcg	gac	gag	ccg	ctc	cgc	aag	agg	152	
Ala	Met	Glu	Ala	Ala	Ser	Gln	Pro	Ala	Asp	Glu	Pro	Leu	Arg	Lys	Arg		
20					25					30					35		
ccc	cgc	cga	gac	ggg	cct	ggc	ctc	ggg	cgc	agc	ccg	ggc	gag	ccg	agc	200	
Pro	Arg	Arg	Asp	Gly	Pro	Gly	Leu	Gly	Arg	Ser	Pro	Gly	Glu	Pro	Ser		
				40					45					50			
gca	gca	gtg	gcg	ccg	gcg	gcc	gcg	ggg	tgt	gag	gcg	gcg	agc	gcc	gcg	248	
Ala	Ala	Val	Ala	Pro	Ala	Ala	Ala	Gly	Cys	Glu	Ala	Ala	Ser	Ala	Ala		
			55					60					65				
gcc	ccg	gcg	gcg	ctg	tgg	cgg	gag	gcg	gca	ggg	gcg	gcg	gcg	agc	gcg	296	
Ala	Pro	Ala	Ala	Leu	Trp	Arg	Glu	Ala	Ala	Gly	Ala	Ala	Ala	Ser	Ala		
	70						75					80					
gag	cgg	gag	gcc	ccg	gcg	acg	gcc	gtg	gcc	ggg	gac	gga	gac	aat	ggg	344	
Glu	Arg	Glu	Ala	Pro	Ala	Thr	Ala	Val	Ala	Gly	Asp	Gly	Asp	Asn	Gly		
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tcc	ggc	ctg	cgg	cgg	gag	ccg	agg	gcg	gct	gac	gac	ttc	gac	gac	gac	392	
Ser	Gly	Leu	Arg	Arg	Glu	Pro	Arg	Ala	Ala	Asp	Asp	Phe	Asp	Asp	Asp		
100					105					110					115		
gag	ggc	gag	gag	gag	gac	gag	gcg	gcg	gcg	gca	gcg	gcg	gcg	gca	gcg	440	
Glu	Gly	Glu	Glu	Glu	Asp	Glu	Ala	Ala	Ala	Ala	Ala	Ala	Ala	Ala	Ala		
				120					125					130			
atc	ggc	tac	cga	gac	aac	ctc	ctg	ttg	acc	gat	gga	ctc	ctc	act	aat	488	
Ile	Gly	Tyr	Arg	Asp	Asn	Leu	Leu	Thr	Asp	Gly	Leu	Leu	Thr	Asn			
			135				140						145				
ggc	ttt	cat	tcc	tgt	gaa	agt	gat	gac	gat	gac	aga	acg	tca	cac	gcc	536	
Gly	Phe	His	Ser	Cys	Glu	Ser	Asp	Asp	Asp	Asp	Arg	Thr	Ser	His	Ala		
	150						155					160					
agc	tct	agt	gac	tgg	act	ccg	cgg	ccg	cgg	ata	ggg	cca	tat	act	ttt	584	
Ser	Ser	Ser	Asp	Trp	Thr	Pro	Arg	Pro	Arg	Ile	Gly	Pro	Tyr	Thr	Phe		
	165					170					175						
gtt	cag	caa	cat	ctc	atg	att	ggc	acc	gat	cct	cga	aca	att	ctt	aaa	632	
Val	Gln	Gln	His	Leu	Met	Ile	Gly	Thr	Asp	Pro	Arg	Thr	Ile	Leu	Lys		
180					185					190					195		
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Asp	Leu	Leu	Pro	Glu	Thr	Ile	Pro	Pro	Pro	Glu	Leu	Asp	Asp	Met	Thr		
				200					205					210			
ctg	tgg	cag	att	gtt	att	aat	atc	ctt	tca	gaa	cca	cca	aag	cgg	aaa	728	
Leu	Trp	Gln	Ile	Val	Ile	Asn	Ile	Leu	Ser	Glu	Pro	Pro	Lys	Arg	Lys		
			215					220					225				
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Lys	Arg	Lys	Asp	Ile	Asn	Thr	Ile	Glu	Asp	Ala	Val	Lys	Leu	Leu	Gln		

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tgt ggg att cct gac ttc aga tca aga gac ggt atc tat gct cgc ctt Cys Gly Ile Pro Asp Phe Arg Ser Arg Asp Gly Ile Tyr Ala Arg Leu 260 265 270 275			872
gcg gtg gac ttc cca gac ctc cca gac cct caa gcc atg ttt gat att Ala Val Asp Phe Pro Asp Leu Pro Asp Pro Gln Ala Met Phe Asp Ile 280 285 290			920
gag tat ttt aga aaa gac cca aga cca ttc ttc aag ttt gca aag gaa Glu Tyr Phe Arg Lys Asp Pro Arg Pro Phe Phe Lys Phe Ala Lys Glu 295 300 305			968
ata tat ccc gga cag ttc cag ccg tct ctg tgt cac aaa ttc ata gct Ile Tyr Pro Gly Gln Phe Gln Pro Ser Leu Cys His Lys Phe Ile Ala 310 315 320			1016
ttg tca gat aag gaa gga aaa cta ctt cga aat tat act caa aat ata Leu Ser Asp Lys Glu Gly Lys Leu Leu Arg Asn Tyr Thr Gln Asn Ile 325 330 335			1064
gat acc ttg gag cag gtt gca gga atc caa agg atc ctt cag tgt cat Asp Thr Leu Glu Gln Val Ala Gly Ile Gln Arg Ile Leu Gln Cys His 340 345 350 355			1112
ggt tcc ttt gca aca gca tct tgc ctg att tgt aaa tac aaa gtt gat Gly Ser Phe Ala Thr Ala Ser Cys Leu Ile Cys Lys Tyr Lys Val Asp 360 365 370			1160
tgt gaa gct gtt cgt gga gac att ttt aat cag gta gtt cct cgg tgc Cys Glu Ala Val Arg Gly Asp Ile Phe Asn Gln Val Val Pro Arg Cys 375 380 385			1208
cct agg tgc cca gct gat gag cca ctt gcc atc atg aag cca gag att Pro Arg Cys Pro Ala Asp Glu Pro Leu Ala Ile Met Lys Pro Glu Ile 390 395 400			1256
gtc ttc ttt ggt gaa aac tta cca gaa cag ttt cat aga gcc atg aag Val Phe Phe Gly Glu Asn Leu Pro Glu Gln Phe His Arg Ala Met Lys 405 410 415			1304
tat gac aaa gat gaa gtt gac ctc ctc att gtt att gga tct tct ctg Tyr Asp Lys Asp Glu Val Asp Leu Leu Ile Val Ile Gly Ser Ser Leu 420 425 430 435			1352
aaa gtg aga cca gta gca cta att cca agt tct ata ccc cat gaa gtg Lys Val Arg Pro Val Ala Leu Ile Pro Ser Ser Ile Pro His Glu Val 440 445 450			1400
cct caa ata tta ata aat agg gaa cct ttg cct cat cta cat ttt gat Pro Gln Ile Leu Ile Asn Arg Glu Pro Leu Pro His Leu His Phe Asp 455 460 465			1448

gta gag ctc ctt gga gac tgc gat gtt ata att aat gag ttg tgt cat	1496
Val Glu Leu Leu Gly Asp Cys Asp Val Ile Ile Asn Glu Leu Cys His	
470 475 480	
agg cta ggt ggt gaa tat gcc aaa ctt tgt tgt aac cct gta aag ctt	1544
Arg Leu Gly Gly Glu Tyr Ala Lys Leu Cys Cys Asn Pro Val Lys Leu	
485 490 495	
tca gaa att act gaa aaa cct cca cgc cca caa aag gaa ttg gtt cat	1592
Ser Glu Ile Thr Glu Lys Pro Pro Arg Pro Gln Lys Glu Leu Val His	
500 505 510 515	
tta tca gag ttg cca cca aca cct ctt cat att tcg gaa gac tca agt	1640
Leu Ser Glu Leu Pro Pro Thr Pro Leu His Ile Ser Glu Asp Ser Ser	
520 525 530	
tca cct gaa aga act gta cca caa gac tct tct gtg att gct aca ctt	1688
Ser Pro Glu Arg Thr Val Pro Gln Asp Ser Ser Val Ile Ala Thr Leu	
535 540 545	
gta gac caa gca aca aac aac aat gtt aat gat tta gaa gta tct gaa	1736
Val Asp Gln Ala Thr Asn Asn Asn Val Asn Asp Leu Glu Val Ser Glu	
550 555 560	
tca agt tgt gtg gaa gaa aaa cca caa gaa gta cag act agt agg aat	1784
Ser Ser Cys Val Glu Glu Lys Pro Gln Glu Val Gln Thr Ser Arg Asn	
565 570 575	
gtt gag aac att aat gtg gaa aat cca gat ttt aag gct gtt ggt tcc	1832
Val Glu Asn Ile Asn Val Glu Asn Pro Asp Phe Lys Ala Val Gly Ser	
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agt act gca gac aaa aat gaa aga act tca gtt gca gaa aca gtg aga	1880
Ser Thr Ala Asp Lys Asn Glu Arg Thr Ser Val Ala Glu Thr Val Arg	
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615 620 625	
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Glu Gly Asn Gln Tyr Leu Phe Val Pro Pro Asn Arg Tyr Ile Phe His	
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ggg gct gag gta tac tca gac tct gaa gat gac gtc ttg tcc tct agt	2024
Gly Ala Glu Val Tyr Ser Asp Ser Glu Asp Asp Val Leu Ser Ser Ser	
645 650 655	
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Ser Cys Gly Ser Asn Ser Asp Ser Gly Thr Cys Gln Ser Pro Ser Leu	
660 665 670 675	
gaa gaa ccc ttg gaa gat gaa agt gaa att gaa gaa ttc tac aat ggc	2120
Glu Glu Pro Leu Glu Asp Glu Ser Glu Ile Glu Glu Phe Tyr Asn Gly	
680 685 690	

ttg gaa gat gat acg gag agg ccc gaa tgt gct gga gga tct gga ttt 2168
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 695 700 705

gga gct gat gga ggg gat caa gag gtt gtt aat gaa gct ata gct aca 2216
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 710 715 720

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 Arg Gln Glu Leu Thr Asp Val Asn Tyr Pro Ser Asp Lys Ser
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<211> 737

<212> PRT

<213> Mus musculus

<400> 26

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 35 40 45
 Glu Pro Ser Ala Ala Val Ala Pro Ala Ala Ala Gly Cys Glu Ala Ala
 50 55 60
 Ser Ala Ala Ala Pro Ala Ala Leu Trp Arg Glu Ala Ala Gly Ala Ala
 65 70 75 80
 Ala Ser Ala Glu Arg Glu Ala Pro Ala Thr Ala Val Ala Gly Asp Gly

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Asp	Asp	Asp	Glu	Gly	Glu	Glu	Glu	Asp	Glu	Ala	Ala	Ala	Ala	Ala	Ala	Ala	
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Ala	Ala	Ala	Ile	Gly	Tyr	Arg	Asp	Asn	Leu	Leu	Leu	Thr	Asp	Gly	Leu		
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Leu	Thr	Asn	Gly	Phe	His	Ser	Cys	Glu	Ser	Asp	Asp	Asp	Asp	Arg	Thr		
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Ser	His	Ala	Ser	Ser	Ser	Asp	Trp	Thr	Pro	Arg	Pro	Arg	Ile	Gly	Pro		
			165						170					175			
Tyr	Thr	Phe	Val	Gln	Gln	His	Leu	Met	Ile	Gly	Thr	Asp	Pro	Arg	Thr		
		180						185					190				
Ile	Leu	Lys	Asp	Leu	Leu	Pro	Glu	Thr	Ile	Pro	Pro	Pro	Glu	Leu	Asp		
		195					200					205					
Asp	Met	Thr	Leu	Trp	Gln	Ile	Val	Ile	Asn	Ile	Leu	Ser	Glu	Pro	Pro		
		210				215					220						
Lys	Arg	Lys	Lys	Arg	Lys	Asp	Ile	Asn	Thr	Ile	Glu	Asp	Ala	Val	Lys		
225				230						235				240			
Leu	Leu	Gln	Glu	Cys	Lys	Lys	Ile	Ile	Val	Leu	Thr	Gly	Ala	Gly	Val		
			245					250					255				
Ser	Val	Ser	Cys	Gly	Ile	Pro	Asp	Phe	Arg	Ser	Arg	Asp	Gly	Ile	Tyr		
		260					265						270				
Ala	Arg	Leu	Ala	Val	Asp	Phe	Pro	Asp	Leu	Pro	Asp	Pro	Gln	Ala	Met		
		275				280						285					
Phe	Asp	Ile	Glu	Tyr	Phe	Arg	Lys	Asp	Pro	Arg	Pro	Phe	Phe	Lys	Phe		
		290				295					300						
Ala	Lys	Glu	Ile	Tyr	Pro	Gly	Gln	Phe	Gln	Pro	Ser	Leu	Cys	His	Lys		
305				310					315					320			
Phe	Ile	Ala	Leu	Ser	Asp	Lys	Glu	Gly	Lys	Leu	Leu	Arg	Asn	Tyr	Thr		
			325					330					335				
Gln	Asn	Ile	Asp	Thr	Leu	Glu	Gln	Val	Ala	Gly	Ile	Gln	Arg	Ile	Leu		
		340						345					350				
Gln	Cys	His	Gly	Ser	Phe	Ala	Thr	Ala	Ser	Cys	Leu	Ile	Cys	Lys	Tyr		
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Lys	Val	Asp	Cys	Glu	Ala	Val	Arg	Gly	Asp	Ile	Phe	Asn	Gln	Val	Val		
		370				375					380						
Pro	Arg	Cys	Pro	Arg	Cys	Pro	Ala	Asp	Glu	Pro	Leu	Ala	Ile	Met	Lys		
385				390					395					400			
Pro	Glu	Ile	Val	Phe	Phe	Gly	Glu	Asn	Leu	Pro	Glu	Gln	Phe	His	Arg		
			405					410					415				
Ala	Met	Lys	Tyr	Asp	Lys	Asp	Glu	Val	Asp	Leu	Leu	Ile	Val	Ile	Gly		
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Ser	Ser	Leu	Lys	Val	Arg	Pro	Val	Ala	Leu	Ile	Pro	Ser	Ser	Ile	Pro		
		435				440					445						
His	Glu	Val	Pro	Gln	Ile	Leu	Ile	Asn	Arg	Glu	Pro	Leu	Pro	His	Leu		
		450				455					460						
His	Phe	Asp	Val	Glu	Leu	Leu	Gly	Asp	Cys	Asp	Val	Ile	Ile	Asn	Glu		
465				470					475					480			
Leu	Cys	His	Arg	Leu	Gly	Gly	Glu	Tyr	Ala	Lys	Leu	Cys	Cys	Asn	Pro		
			485					490					495				
Val	Lys	Leu	Ser	Glu	Ile	Thr	Glu	Lys	Pro	Pro	Arg	Pro	Gln	Lys	Glu		
		500						505					510				
Leu	Val	His	Leu	Ser	Glu	Leu	Pro	Thr	Pro	Leu	His	Ile	Ser	Glu			
		515				520					525						
Asp	Ser	Ser	Ser	Pro	Glu	Arg	Thr	Val	Pro	Gln	Asp	Ser	Ser	Val	Ile		
		530				535					540						

Ala Thr Leu Val Asp Gln Ala Thr Asn Asn Asn Val Asn Asp Leu Glu
 545 550 555 560
 Val Ser Glu Ser Ser Cys Val Glu Glu Lys Pro Gln Glu Val Gln Thr
 565 570 575
 Ser Arg Asn Val Glu Asn Ile Asn Val Glu Asn Pro Asp Phe Lys Ala
 580 585 590
 Val Gly Ser Ser Thr Ala Asp Lys Asn Glu Arg Thr Ser Val Ala Glu
 595 600 605
 Thr Val Arg Lys Cys Trp Pro Asn Arg Leu Ala Lys Glu Gln Ile Ser
 610 615 620
 Lys Arg Leu Glu Gly Asn Gln Tyr Leu Phe Val Pro Pro Asn Arg Tyr
 625 630 635 640
 Ile Phe His Gly Ala Glu Val Tyr Ser Asp Ser Glu Asp Asp Val Leu
 645 650 655
 Ser Ser Ser Ser Cys Gly Ser Asn Ser Asp Ser Gly Thr Cys Gln Ser
 660 665 670
 Pro Ser Leu Glu Glu Pro Leu Glu Asp Glu Ser Glu Ile Glu Glu Phe
 675 680 685
 Tyr Asn Gly Leu Glu Asp Asp Thr Glu Arg Pro Glu Cys Ala Gly Gly
 690 695 700
 Ser Gly Phe Gly Ala Asp Gly Gly Asp Gln Glu Val Val Asn Glu Ala
 705 710 715 720
 Ile Ala Thr Arg Gln Glu Leu Thr Asp Val Asn Tyr Pro Ser Asp Lys
 725 730 735
 Ser

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Val Pro Arg Ala Pro Thr Pro Phe Pro Trp Pro Ser Arg Thr Asp Ser	
20 25 30	
gac tcg gac act gag gga gga gcc act ggt gga gag gca gag atg gac	143
Asp Ser Asp Thr Glu Gly Gly Ala Thr Gly Gly Glu Ala Glu Met Asp	
35 40 45	
ttc ctg agg aat tta ttc acc cag acc ctg ggc ctg ggt tcc caa aag	191
Phe Leu Arg Asn Leu Phe Thr Gln Thr Leu Gly Leu Gly Ser Gln Lys	
50 55 60	
gag cgt ctt cta gac gag ctg acc ctc gaa gga gtg aca cgc tac atg	239
Glu Arg Leu Leu Asp Glu Leu Thr Leu Glu Gly Val Thr Arg Tyr Met	
65 70 75	
cag agc gag cgc tgc cgc aag gtc atc tgt ttg gtg gga gcc gga atc	287
Gln Ser Glu Arg Cys Arg Lys Val Ile Cys Leu Val Gly Ala Gly Ile	
80 85 90 95	
tcc acg tcc gcg ggt atc cct gac ttc cgc tcc ccg tcc act ggc ctc	335
Ser Thr Ser Ala Gly Ile Pro Asp Phe Arg Ser Pro Ser Thr Gly Leu	
100 105 110	
tat gca aac ctg gag aag tac cac ctt cct tac cca gag gcc atc ttt	383
Tyr Ala Asn Leu Glu Lys Tyr His Leu Pro Tyr Pro Glu Ala Ile Phe	
115 120 125	
gag atc agc tac ttc aag aaa cat ccg gaa ccc ttc ttt gcc ctt gcc	431
Glu Ile Ser Tyr Phe Lys Lys His Pro Glu Pro Phe Phe Ala Leu Ala	
130 135 140	
aag gag ctc tat ccc ggg cag ttc aag cca acc atc tgc cac tac ttc	479
Lys Glu Leu Tyr Pro Gly Gln Phe Lys Pro Thr Ile Cys His Tyr Phe	
145 150 155	
atc cgc ctg ctg aag gag aag ggg ctg ctg ctg cgc tgc tac acg cag	527
Ile Arg Leu Leu Lys Glu Lys Gly Leu Leu Leu Arg Cys Tyr Thr Gln	
160 165 170 175	
aac ata gac acg ctg gaa cga gtg gcg ggg ctg gag ccc cag gac ctg	575
Asn Ile Asp Thr Leu Glu Arg Val Ala Gly Leu Glu Pro Gln Asp Leu	
180 185 190	
gtg gag gcc cac ggc acc ttc tac aca tca cac tgt gtc aac acc tcc	623
Val Glu Ala His Gly Thr Phe Tyr Thr Ser His Cys Val Asn Thr Ser	
195 200 205	
tgc aga aaa gaa tac acg atg ggc tgg atg aaa gag aag att tct cag	671
Cys Arg Lys Glu Tyr Thr Met Gly Trp Met Lys Glu Lys Ile Ser Gln	
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 35 40 45
 Leu Arg Asn Leu Phe Thr Gln Thr Leu Gly Leu Gly Ser Gln Lys Glu
 50 55 60
 Arg Leu Leu Asp Glu Leu Thr Leu Glu Gly Val Thr Arg Tyr Met Gln
 65 70 75 80
 Ser Glu Arg Cys Arg Lys Val Ile Cys Leu Val Gly Ala Gly Ile Ser
 85 90 95
 Thr Ser Ala Gly Ile Pro Asp Phe Arg Ser Pro Ser Thr Gly Leu Tyr
 100 105 110
 Ala Asn Leu Glu Lys Tyr His Leu Pro Tyr Pro Glu Ala Ile Phe Glu
 115 120 125
 Ile Ser Tyr Phe Lys Lys His Pro Glu Pro Phe Phe Ala Leu Ala Lys
 130 135 140
 Glu Leu Tyr Pro Gly Gln Phe Lys Pro Thr Ile Cys His Tyr Phe Ile
 145 150 155 160
 Arg Leu Leu Lys Glu Lys Gly Leu Leu Leu Arg Cys Tyr Thr Gln Asn
 165 170 175
 Ile Asp Thr Leu Glu Arg Val Ala Gly Leu Glu Pro Gln Asp Leu Val
 180 185 190
 Glu Ala His Gly Thr Phe Tyr Thr Ser His Cys Val Asn Thr Ser Cys
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 Gln Leu Pro Gly Val Ser Ser Val
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